IPAMS Position Paper
Proposed BLM Uinta Basin-Wide Environmental Impact Statement

IPAMS

BLM is considering a Uinta Basin-Wide EIS in northeastern Utah to account for the cumulative impacts of oil and gas development. The BLM believes they are vulnerable to legal challenges on the basis of NEPA deficiencies with respect to cumulative impacts analysis. However, the Independent Petroleum Association of Mountain States (IPAMS) believes the Basin-Wide is unnecessary and will actually increase BLM's litigation risks because:

- It invites a court to infer that the NEPA work BLM has done and is doing is legally inadequate and will be read as an admission of agency failure. This inference will be exploited by environmental plaintiffs seeking to halt oil and gas development in the Uinta Basin, which contains significant energy resources vital to Utah (approximately 15 to 20 trillion cubic feet of natural gas) and the U.S.
- It ignores the extensive cumulative impact analyses already completed and underway in the Vernal and other Field Offices.
- It creates the fiction of "basin-wide" development and gives obstructionist groups one big target rather than the requirement to challenge resource development on a project-by-project basis.

Instead, IPAMS proposes that the BLM:

- Focus on getting the Vernal and Price Time-Sensitive Resource Management Plans (RMP) completed. The Draft RMPs should be revised to include a quantitative cumulative impacts analysis based on past, present, and reasonably foreseeable development. These additions could be done quickly and would not require significant new analyses, time or staff resources.
- Upon completion of the RMPs, BLM could develop a Basin-Wide technical report on air quality, which could be used by BLM for individual project authorizations and for future amendment of the RMPs.
- In addition, upon completion of the RMPs, BLM could conduct a Basin-Wide Oil and Gas Leasing and Development EIS similar to that done by the Colorado BLM. This EIS would also serve as an amendment to the RMPs to ensure a solid basis for continued development of the prolific oil and gas resources in Utah.

Why this issue is important:

- Land management decisions and energy development are being held up by the delay to the Vernal and Price RMPs. A Basin-Wide EIS would drain resources away from the RMPs to another large, minimum two-year effort.
- A Basin-Wide EIS would invite significant legal challenges, and could result in **an injunction against further energy development** until it is completed.
- Basin-Wide EIS would create further delays to the efficient development of Utah's resources, **negatively impacting** the State of Utah in terms of lost royalties, lost taxes, lost jobs and other economic losses.

Utah Basin Advisory Committee Meeting Minutes
April 10, 2007 10:00

IPAMS

Participants

Bruce Kelso, Berry, State VP
Bill Shearer, The Retec Group
Kathleen Corr, Bjork Lindley Little
Eric Dillé, EOG Resources
Vanessa Cameron, E3
Dave Holland, Pioneer
Richard Bell, Petros Environmental
Dave Gerbig, Newfield
Jim Felton, Bill Barrett
Joe Fetzer, Petros Environmental
Marty Buys, Buys & Associates
Lee Peacock, UPA
Bret Sumner, Fulbright & Jaworski
Kimberly Mazza, Pioneer
Doug Henderer, Buys & Associates
Debbie Stanberry, Questar
Jane Seiler, Questar
David Smith, GasCo
Jack Ekstrom, Pioneer
Bill Sparks, Fulbright & Jaworski
Ken Smith, Petroglyph Energy
Lowell Braxton, IPAMS
Kathleen Sgamma, IPAMS
Spencer Kimball, IPAMS

Ongoing Issues

Basin-Wide EIS: IPAMS met with the Utah Congressional Delegation and Henri Bisson, BLM Deputy Director for Operations during the Call-Up the last week of March. IPAMS has formally asked the delegation to contact the BLM to express opposition to the Basin-Wide EIS (BWEIS) and request that they instead focus on completing the RMPs. The meeting with Henri Bisson was positive as well. We expressed IPAMS' united opposition to the BWEIS and our unwillingness to fund it. He agreed to meet with us again in the near future along with Jim Hughes, Acting Director, Jim Harris, Solicitor for Minerals, and Selma Sierra. We're trying to schedule a meeting in conjunction with her trip to DC on the 24th and 25th. The alternative is a meeting in Denver, although Jim Harris would probably not be available. **Update:** IPAMS has a meeting scheduled with Henri and Selma on April 26th in DC.

A complicating factor is the Anadarko Bonanza EA which includes drilling in citizen-proposed wilderness areas. SUWA has asked for State Office Director Review of the EA citing possible basin-wide cumulative impacts in the request for the review. Anadarko has asked Selma to "hold" on her review obligation pending continued discussions between Anadarko and SUWA. This is increasing the pressure on Selma, so the group discussed ways to ensure we're not just opposing the BLM, but are working to offer solutions. The group agreed that we would continue the effort that was presented to Selma on March 13th, i.e., the suggestion of finishing the RMPs and following that with a state-wide oil and gas EIS following the Colorado model. The Colorado state-wide amended six oil and gas RMPs.

Greg Noble is transferring from the BLM Alaska State Office to the Utah BLM State Office to be Chief of Fluid Minerals on a temporary basis for 120 days. He is supposed to start in Utah within the next two weeks. Greg is currently the Chief of Fluid Minerals for the Alaska State Office and formerly worked with Henri.

The BLM is also looking at doing away with the various wilderness designations (Wilderness Study Areas from FLPMA, Wilderness Inventory Areas from the Babbitt-era reinventory, and citizen-proposed wilderness) and treating them all the same. That would violate the 2003 settlement agreement between Utah and the BLM and create de-facto wilderness.

For the meeting with the BLM the week of April 24th, the suggestion was made to include some of the Utah delegation, county commissioners, the state, and the Utah Association of Counties. This would increase the scope of the meeting as already discussed with Henri, but would be a good follow-up meeting to have in Salt Lake City. For the meeting in DC, the group agreed that participants should include Lowell, Fulbright & Jaworski, and Mark Ward with UAC.

Water Depletion Biological Opinion: This issue will be put to rest soon. Enduring, EOG, Bill Barrett, Dominion and Pioneer have agreed to contribute. By paying the $29,739, the section 7 consultations for the four affected fish species are taken care of for five years for any exploration wells not covered by a larger project document. All companies may benefit from this in the future, so please let Kathleen know if you can contribute as well.

Leasing and Expressions of Interest: The May sale announcement has gone out. Certain leases that were nominated two years ago are now being deferred for another year while the BLM evaluates Areas of Critical Environmental Concern (ACEC). With the new Chief of Fluid Minerals coming in soon, there is an opportunity for advocacy on this issue.
Action Item: Schedule an EOI/Leasing meeting within the month to carry forward the work on leasing begun in November, and to determine how to approach Greg Noble.

Produced Water Disposal: Lowell is meeting today with John Baza and Gil Hunt on this issue.

Legislative Wrap-up: Lee pointed out that it's time to get back in touch with Rep. Mathis to ensure he feels his constituents concerns on split-estate issues are being addressed. Lowell had a meeting with Bill Hopkin, Director of Grazing Improvement, Utah Department of Agriculture, and discussed options for improving public relations with the grazing community. He is working on putting together some options

for members, which will be presented soon and worked into an outreach program.

Governor's Energy Summit: The Governor's Utah Energy Summit will be April 15th – 17th in Salt Lake City. Registration is available at www.UtahEnergySummit.com. Monday is the most important day. Deputy Secretary of the Interior Lynn Scarlett is planning to attend.

Air Quality: A number of companies are reviewing the Utah draft general permit prepared by Fulbright & Jaworski. DAQ is waiting for the draft.

Redrock Wilderness Initiative: IPAMS put together talking points (attached) about Rep. Maurice Hinchey's anticipated reintroduction of the Redrock Wilderness Act, and discussed the Act with the Utah delegation and members of the Interior Appropriations Subcommittee. He's also threatened to include language in the DOI appropriation that would preclude leasing on any lands included in his act. The probability for Hinchey's success is low, since none of the delegation supports the Act.

Surface Use Agreements on Trust Lands: The issue of SITLA demanding higher fees on trust lands was raised at the last UBAN meeting. Lowell has tried to contact Lavonne Garrison, but has not had success yet. SITLA has asked Newfield for a high annual rental for a compressor station, but no one else knew of similar experiences. Companies should contact Lowell if they encounter any problems.

The Uinta Basin Collaborative Meeting takes place on the 12th. Since no one had additional issues to raise, Lowell will continue to push the BLM to finalize the RMPs.

A Planning Meeting with Lowell's Sponsors will be held on April 27th from 11:30 – 1:00 for lunch. All sponsors are invited.

Next Meeting May 8th, 10:00

Utah Basin Advisory Network Meeting Minutes
May 8, 2007 10:00am

IPAMS

Participants

Kathleen Corr, Bjork Lindley Little
Eric Dillé, EOG Resources
Vanessa Cameron, E3
Jim Felton, Bill Barrett
Joe Fetzer, Petros Environmental
Bret Sumner, Fulbright & Jaworski
Debbie Stanberry, Questar
David Smith, GasCo
Bill Sparks, Fulbright & Jaworski
Mike Dulacki, Delta Petroleum
Logan MacMillan, Anadarko
Kirby Carroll, Buys & Associates
Bill Houston, Samson Resources
Al Pierson, PBS&J
Fred MacDonald, Pruitt Gushee
Bruce Johnston, Slate River
Kathleen Sgamma, IPAMS
Spencer Kimball, IPAMS

Ongoing Issues

Basin-Wide EIS: Lowell Braxton, Eric Dillé, and Bill Sparks, Poe Leggette, and Spofford Canfield of Fulbright & Jaworski met with Selma Sierra, Henri Bisson, Kent Hoffmann, Bill Stringer, Jeff Rawson (Associate State Director) on April 26th in Washington, D.C. to discuss the basin-wide EIS (BWEIS). Bret and Kathleen joined on the phone. The meeting was encouraging from the stand point that Henri agrees with our position and doesn't believe it's necessary to conduct further analysis until after the RMPs are complete. However, a follow-up meeting on May 3rd in Salt Lake City where Poe, Bret, Lowell, Eric, Dale Birdwell of Dominion, and Tom Clayson of Anadarko met with Jeff, Kent, and Bill was not so promising. Selma seems determined to pursue a BWEIS before the RMPs are complete, largely on the advice of Kent and Bill.

An air quality technical analysis was also discussed at both meetings. IPAMS and the BLM is in agreement on the need to do a separate technical study, but the particulars of the study are not clear yet. Bill Stringer will be in Denver meeting with the Colorado BLM office and EPA on air issues across state boundary lines, and will probably come away from those meetings with ideas on what the Uinta study should look like. Bret will try to meet with him in Denver.

Despite the disappointment that the Utah State office still seems set on pursuing a BWEIS, the good news is that we've succeeded in delaying it, as the state office was ready to issue a notice of intent on March 8th. This delay has enabled us to solidify support for our position from the Utah delegation, the Governor, and SITLA, which may ultimately postpone the BWEIS until after the RMPs. To achieve that goal, we need to step up the effort and get those allies to contact Selma directly. We've

also succeeded in getting BLM buy-in to an air quality technical report that's not tied to a NEPA document.

A complicating factor is the involvement of the Northern Utes. They are working on an EIS on their lands, and Bill Stringer thinks the efforts could be combined for cumulative impacts and the air study. The BLM may be looking to the tribe to help fund a BWEIS, especially after IPAMS made it clear we weren't interested in sponsoring. New tribal elections further complicate the issue and may explain why previous efforts to collaborate on these issues have fizzled. The new tribal council may not be anti-industry, but interested in changing some of their current arrangements. **Update from Fred MacDonald:** The internal Business Committee elections results were released on May 14th. The new Chairperson is Curtis Cesspooch (a newly elected member who has served on the BC in the past) and the Vice Chair is Irene Cuch (who was not up for re-election this year). What this bodes for the future of the Tribe's present advisors and business practices remains to be seen.

Next Steps on the BWEIS:

- Focus BLM's efforts on the air quality study.
- Update Henri Bisson on the outcome of the SLC meeting and see if he can apply leverage to dissuade the Utah office.
- Eric to update the Governor's office and SITLA on the persistence of the BWEIS, and have them contact Selma directly.
- Discuss with the acting Chief of Fluid Minerals, Greg Noble.
- Meet with Utah Delegation staffers in WDC. The purpose of the meeting will be to brief them on progress and ask them to contact Selma directly.
- Speak to the counties and Mark Ward about the strategy and try to solidify their position in support of IPAMS.
- Meet with the EPA to determine their position on cumulative impacts and air quality.

Leasing and Expressions of Interest: A group met the previous day on this topic, and the main action item is to meet with Greg Noble, the new acting Chief of Fluid Minerals for the Utah BLM to determine what his mandate is in the short time he has (four months), and communicate industry's concerns with suspended and deferred leases.

Another item to consider is a hosted worker program for leasing. Participants were asked to consider whether their companies would be interested in helping to fund the program.

Produced Water Disposal

Lowell met with DOGM recently and they're exploring meeting with the

Utah Basin Advisory Network Meeting Minutes
August 14, 2007 10:00am MDT

Participants

Jim Felton, Bill Barrett, State VP
Katie Corr, Bjork Lindley Little
Eric Dillé, EOG Resources
Debbie Stanberry, Questar
David Smith, GasCo
Bill Shearer, Black Hills Energy
Ken Smith, Petroglyph Energy
Gary Davis, Slate River
Lowell Braxton, IPAMS
Kathleen Sgamma, IPAMS
Spencer Kimball, IPAMS

Ongoing Issues:

Uinta Basin-Wide EIS (BWEIS) has successfully been completed as an issue and is off the table for the rest of the year. The BLM is doing an internal review of available EAs and EISs, and has indicated they will not conduct a public NEPA process until 2008 at the earliest.

Air Quality: As part of our successful strategy to kill the BWEIS, IPAMS and the Fulbright and Jaworski operators group advocated for a non-NEPA technical air study. BLM has adopted this strategy, and Bill Stringer has been given responsibility for it. The Fulbright and Jaworski group presented him with a study methodology which he thinks is a good approach, and has briefed Selma Sierra. The next step is to get approval from Scott Archer, who is in charge of regional air quality for the BLM. Bill is meeting with EPA Region 8 at the end of the month to get approval as well. IPAMS members may be asked to help fund the study.

Leasing and Expressions of Interest: Greg Noble has finished his temporary assignment as Acting Chief of Fluid Minerals. The group who met with him in June provided an EA template document, which he seems to have implemented. If so, that was a positive outcome of his brief tenure, and should improve lease processing somewhat. The state BLM has just announced the new Chief of Fluid Minerals, Becky Hammond from the Arizona BLM. **Action Item:** IPAMS will organize a group to meet with her in mid-October similar to the group that met with Greg and with the same agenda.

Produced Water Disposal: Lowell is working with DOGM on EPA delegation of authority to the state on UIC permitting. The efforts include a short-term delegation to clear the backlog of 25-30 permits which are taking between six and eighteen months to approve. Funding for the effort is to be determined, with an EPA hosted worker program as a possibility. Lowell will meet with Diane Nielson, the Governor's Energy

Policy Advisor, and John Baza of DOGM in early September to discuss a memorandum of agreement between DOGM and EPA.

A longer-term solution may to get the authority delegated to the Utes. Based on original tribal boundaries, almost all of the Uinta Basin is considered Indian Country, and hence, the EPA has jurisdiction for UIC permits. Before going to the tribe on this, we will wait until Lowell finishes his work with Diane and John on an MOA.

Socio-Economic Analysis: Operator response to the survey has been good, but we are still lacking sufficient responses from contractors, particularly drilling companies. Responses representing only 12% of the wells drilled in 2006 have been received. Lowell will be going to the basin with Alan Isaacson of the University of Utah to try to get responses directly from the companies, but we still need operators to contact their drilling and service and supply companies and ask them to fill out the survey.

New Issues

The Uinta Basin Partners for Conservation and Development provides the planning and disperses funding for multi-agency rangeland and watershed improvement in the Uinta Basin. Industry participation in these programs is being sought, and is voluntary and non-precedent setting. The group is looking to the supposedly voluntary efforts in southwestern Wyoming as a model for Utah operators, but they fail to account for the differences in reserves, costs of production, etc. between the areas, and fail to recognize that the Wyoming efforts have a quid pro quo attached to them.

Lowell has been attending their meetings, and has reminded them that royalties from development are available to the state and federal governments for projects such as habitat improvement. A meeting on July 26th included the Utah Department of Natural Resources Director Mike Styler; Selma Sierra, BLM; Jack Troyer, USFS; Kathleen Clarke, Utah Department of Agriculture; Rory Reynolds, Utah Division of Wildlife Resources; John Baza, DOGM; Ron Daniels, Utah Governor's Energy Policy office; Lee Peacock, Utah Petroleum Association; David Litvin, Utah Mining Association; and Ruland Gil, Questar.

Lowell is also working on getting them to realize that off-site mitigation should be on the table. BLM has balked at off-site mitigation since their Instruction Memorandum (IM) expired two years ago. Lowell has talked to Selma Sierra about getting that renewed. The group should also be working on cross jurisdictional issues, as wildlife do not respect agency boundaries. For example, EOG was approached about a habitat improvement project on Forest Service lands, but the BLM is not

interested in off-site mitigation on non-BLM land. **Action Item:** Lowell will work on off-site mitigation with Kathleen Clarke and Selma. He will ask for a specific list of prioritized projects from them, which companies can choose to support as they see fit. Lowell will continue to educate the UBPCD that companies are interested in supporting wildlife, watershed and landscape projects, but only if they are specific projects in the areas they operate that provide tangible, on-the-ground benefits.

Legislative Event: Lowell and Lee are working on scheduling a breakfast for legislators in conjunction with their October interim meeting on the 17th. We will invite members of the leadership and key Natural Resources, Finance, Budget, Agriculture, and Utilities committees. **Action Item:** Jim will contact Chuck Stanley, Questar and IPAMS President, to speak at the legislative breakfast.

Division of Wildlife Resources Rule-Making: The Division of Wildlife Resources is putting together reclamation rules for state lands, a good portion of which are in the Uinta Basin. Their rules may conflict with DOGM rules, or could result in two sets of rules. **Action Item:** Lowell will contact John Baza to determine if they would be duplicative.

Other Issues

Judge Kimball recently dismissed a suit regarding 2004 leases. While the 2003 leases, which were the subject of last year's Kimball decision, are still suspended, the ruling was positive in that it takes away some of SUWA's arguments. The BLM has suspended leases in wilderness inventory areas since 2003 affected by last year's Kimball decision. The recent decision says that by suspending the leases, the BLM resolved the legal problems affecting the leases and the case is "moot" because there's no other relief the court can grant. SUWA had attempted to amend its complaint to challenge other leases in WIAs, and this decision removes the basis for SUWA to appeal any of the leases in WIAs issued since 2003 while they are in suspense. So, the decision is good because we won't see any more federal court suits over leases in WIAs for a while. However, the decision won't change the fact that the leases are already in suspense.

Governor Blue Ribbon Advisory Council on Climate Change (BRAC) continues its work. Since EPA is not adequately funding air quality at the state level, there's talk of how to fund greenhouse gas and other air quality initiatives. The BRAC has even discussed a vehicle registration or gas tax to fund these efforts.

Next Meeting September 11th, 10:00

Utah Basin Advisory Network Meeting Minutes
September 11, 2007 10:00am MDT

IPAMS

Participants

Jim Felton, State VP, Bill Barrett
Katie Schroder, Bjork Lindley Little
Eric Dillé, EOG Resources
Vanessa Cameron, E3 Consulting
Bret Sumner, Fulbright & Jaworski
Debbie Stanberry, Questar
David Smith, GasCo
Logan MacMillan, Anadarko
Bill Shearer, Black Hills
Kent Keppel, Running Foxes Petro.
Linda Guthrie, Devon
Carla Konopka, Petro-Canada
Mike Dulacki, Delta Petroleum
John Davis, Pruitt Gushee
Eric Shivey, Ute Energy
Kimberley Mazza, Pioneer
Chris Castillian, Anadarko
Gary Davis, Slate River
Kathleen Sgamma, IPAMS
Spencer Kimball, IPAMS

Ongoing Issues

Air Quality: As part of our strategy to oppose the BLM's proposed Basin-wide EIS (BWEIS) and encourage them to instead focus on the RMPs, IPAMS and a group of operators led by Fulbright & Jaworski proposed that the BLM conduct a non-NEPA technical study of the air quality in the Uinta Basin. The Fulbright & Jaworski group have put together a project proposal with Bill Stringer, and recently met with Scott Archer and got his approval as well.

Fulbright & Jaworski, having achieved the goal of diverting the BLM from the BWEIS and getting them to adopt the air quality study, are ready to turn the project over to IPAMS and get the broader range of Utah producers involved. The study will benefit all Utah producers, since it will help address challenges based on cumulative impact and will tiered off by other NEPA documents. Attached to these minutes is a project description.

The BLM will work with the tribe and EPA to get their buy in. The cost may be around $250K, but could be dwarfed by having to do separate air studies for each individual EIS in the absence of this proposed comprehensive study.

The air model to be run is CMAQ, which is preferred by the Utah Dept. of Air Quality and EPA. As a non-NEPA study, it will not have to go to the public until it is used in a NEPA document in the future. Vanessa suggested reviewing comments made by Megan Williams on other NEPA documents such as the Little Snake RMP to see what the criticisms will be and how the study can counter them. Megan used to work for the

EPA and now does consulting for various environmental groups such as SUWA and Upper Green River Valley Coalition.

There is no update on **Leasing and Expressions of Interest**. We are waiting for Becky Hammond, the new Chief of Fluid Minerals, to take over in early October, and will schedule a meeting with her soon thereafter.

Produced Water Disposal: Lowell will meet with Diane Nielson, the Governor's Energy Policy Advisor and John Baza, Director of DOGM on September 18th. Lowell is currently on a trip to the Pinedale Anticline with the Uinta Basin Partners for Conservation and Development, including Diane. She is willing to help us, but wants to ensure that John is on board with the plan. The idea is to have the state send a letter to the Ute tribe asking them to formally ask EPA for UIC permitting authority for the state. Once that request is made, IPAMS will need to approach the tribal Business Committee. DOGM may also need additional funding to take on the additional permitting activities. Lowell will provide an update after his September meeting.

Response from operators to the **Socio-Economic Analysis** has been excellent. However, we're still lacking sufficient data from drilling companies. An appeal was made for operators to contact Ensign and Patterson to ask them to fill out the survey.

Uinta Basin Partners for Conservation and Development: Lowell took a trip to southwest Wyoming with UBPCD to tour sites in Pinedale in order to learn about the mitigation efforts of industry. (See last month's minutes for more info about the group.) They want industry funding for mitigation projects in Utah, but none of their projects are in our areas of operation. Lowell has informed them that companies are only interested in projects in their areas of operations.

Legislative Breakfast: Planning continues for the legislative breakfast on October 17th. While we've seen the Governor waiver in his support of oil and gas, we need to more actively engage the legislature. Another broad goal is to educate legislators from areas with new plays who are unfamiliar with oil and gas activity. The suggestion was made to bring in the Utah Association of Counties, county commissioners, agriculture, and other groups. We could bring in a few others, but we want to make sure that the right balance is struck, that we don't overwhelm the legislators, and that our message is not diluted.

Division of Wildlife Resources Rule-Making: John Davis gave an overview of the issues associated with DWR lands and the recently enacted rules that went into effect. The new DWR rules apply only on

DWR lands, not SITLA lands. DWR acquires land in varies ways and under various conditions, such as buying land in fee, from conservation groups, federally acquired, or through a conservation easement. Sometimes they own the minerals as well. Development on federally-acquired land requires NEPA, but the question arises if the state can enforce NEPA. Traditionally, there's been very little development on DWR lands, but that's changing.

Even on tracts that don't require NEPA, provisions in the new rules require projects to conduct NEPA-like actions, such as examining alternatives like directional drilling, identifying impacts to wildlife, biological assessments, and T&E surveys. The rules conflict with existing DOGM rules. **Action Item:** Lowell to talk to Mike Styler about the potential for conflict. John will update us on his conversation with John Baza.

Comments on the **Moab RMP** are due November 30th. IPAMS will be commenting and asked for those companies in the planning area to share comments if willing. The big issue in Moab is off-highway vehicles, which will be cut off from a large area. OHV groups should be part of a mobilization effort to include Chambers of Commerce and county commissioners. Some 'innovative' provisions for wilderness characteristics and wildlife are problematic and could be precedent setting. In addition, the RFD is inadequate with only about 350 wells, although at this point it's difficult to estimate what that number should be. Delta and Samson operate in the area, and we need to get other affected operators involved. As with any RMP, even if it doesn't directly impact a company, the precedents set with show up in other RMPs, so comments from other companies are important.

UNEV Pipeline Project Comments: IPAMS will submit comments.
Action Items: Kathleen to contact UPA and black wax producers to coordinate comments.

Uinta Basin Energy Days: The Vernal Chamber of Commerce is taking the lead on the Uinta Basin Energy Days, which will be for just one day, probably on May 21st. It will be patterned on the COGA Western Slope Energy Forum in Grand Junction. The day will include national, state, and local presenters, with a larger public event such as a BBQ. Lowell is attending a meeting on September 18th at the Vernal Chamber, and will provide more details at the next UBAN meeting.

Other Issues
Kimball Wilderness Case: Fulbright & Jaworski filed a briefing in the Tenth Circuit Court of Appeals supporting the appeal of the August 2006 Kimball decision. The August '06 decision suspended sixteen leases from

a 2003 lease sale when Judge Kimball determined that the BLM failed to consider new information on wilderness characteristics. The Fulbright & Jaworski appeal is on behalf of EOG and XTO, and questions SUWA's standing in the case and whether the court has jurisdiction. Oral arguments have not been scheduled yet.

Next Meeting October 9th, 10:00

Utah Basin Advisory Network Meeting Minutes
April 8, 2008 10:00 MST

IPAMS

Participants

Jim Felton, State VP, Bill Barrett
Katie Schroder, Bjork Lindley Little
Linda Guthrie, Devon
David Richardson, Delta
Ahna Mee, Arista Midstream
David Smith, Gasco
Sheila Castellano, SWCA
Brooke Bell, Anadarko
Logan McMillan, Anadarko
Jevin Croteau, EnCana
David Herrington, O&G
Marty Buys, Buys & Associates
Lowell Braxton, IPAMS
Kathleen Sgamma, EOG Resources
Spencer Kimball, IPAMS
Andrew Bremner, IPAMS

Ongoing Issues

Uinta Basin Air Quality Study: There was a stakeholder meeting on March 26th in Denver with Wes Wilson with EPA and Scott Archer with the Forest Service. Mr. Wilson continues to raise concerns about the unresolved technical issues and has offered very little constructive input.

IPAMS will hold a Technical Air Quality Committee Meeting on April 24th at 9:30 am MST. The purpose of the meeting is to update the group on WRAP Phase III and Uinta Basin Air Quality Study projects. In addition we will be determining the long-term methodology that will be used to project future years in each of the basins throughout the Rockies. We will discuss the UBAQS tangentially, but this is a highly crucial meeting in determining future-year projection technology and modeling.

Bill Stringer has turned down his offer to be Chief of Fluid Minerals in Wyoming and will stay in the Vernal Field Office and will continue working with IPAMS on the UBAQS. Lowell reports that after recent meetings with Selma Sierra, she hopes to move him into the District Management Position in the near future.
Action Item: Lowell to meet with Selma to determine what else we can do to keep Stringer going to bat for industry.

Wilderness Advocacy Effort: The first session of oral arguments in the initial Kimball Decision Appeal was heard on March 19th in the 10th Circuit Court in Denver. The presiding judge questioned the urgency in which the plaintiffs are moving forward with the appeal and contrasted the contested resource play with a 'rotting box of bananas' in that the

natural gas trapped underground isn't going anywhere in the near future. Thus, we can't expect this appeal to move with any urgency.

Fulbright & Jaworski met with the BLM on behalf of EOG and XTO and discussed how field offices are receiving little guidance from BLM in Washington D.C. and that vague wilderness definitions are forcing BLM to err on the side of caution when proceeding with actions related to parcels with wilderness characteristics. Unfortunately, little came out of that meeting.

Rural Coalition: This group holds weekly breakfast meetings which Lowell has been attending. The group will continue to meet regularly with Utah State government officials to keep the rural development needs focused. It is a good forum to keep our issues in front of state officials, and to broker ideas between legislative sessions. Lowell recommended reasserting energy interests in the coalition and hopes to provide an outline of our most pressing issues to Gail McKerney, like the one he provided for Selma Sierra when she started. **Action Item**: For the next meeting, Lowell agreed to have the following items added to the agenda:

1. Getting the BLM to finalize RMPs
2. Wilderness characteristics
3. APDs

Socio-Economic Analysis: The Socio-economic Analyses have been completed and are now available on the Utah page. In order for the studies to be effective, the committee is adamant about creating a comprehensive state economic report, much like the CERI report from the Colorado School of Mines. Lowell contacted John Harja about contracting a report that would synthesize the various socio-economic reports and produce a statistic illustrating total economic benefit to the state from oil and gas development, but there has been disagreement on how to best synthesize the data. **Action Item**: Lowell to talk to John Harja about setting up a meeting with Dag Numedaal with CERI to discuss methodologies.

Please note: Alan Isaacson was tragically killed on a camping trip in March. Please contact Lowell for details.

APD Survey: The flexibility afforded the Vernal BLM office by virtue of its Pilot Office status could be used to create a role for the Division of Oil, Gas and Mining to provide support to the backlogged BLM APD process. Interested parties have reaffirmed the APD backlog is with the NEPA

National Environmental Solutions (NES) has begun a comprehensive strategy to respond to the status review. Please contact Spencer for updates from their working group.

SITLA/DOGM Outreach: Livan Garrison with SITLA is spearheading an outreach effort in Utah to highlight the value of the state's vast mineral resources. She will give a presentation about the effort during our next UBAN meeting (May13th), so please allow another half an hour for her presentation.

SOPA: Representative John Mathis has been pressured by sheep ranchers and others to introduce a Surface Owners' Protection bill. The bottom line is that only 3% of pending APDs are on split-estate lands, so a comprehensive SOP bill will do little mitigate current problems. It was recommended that IPAMS and UPA set up a 'venting session' for interested parties to show that operators are savvy to hearing surface owners' concerns on a frequent basis. We should expect the bill to be introduced in the next session, which begins in October.

Produced Water: No update. John Baza sent a letter to the tribe regarding delegation of UIC permitting to the tribe from the EPA, but there has been little momentum. **Action Item**: Lowell to draft a letter with technical aspects and send to Dianne Nielson for approval.

Next Meeting: May 13th, 10:00 am MST

UINTA BASIN AIR QUALITY STUDY
(UBAQS)

Prepared for

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June 30, 2009

EXECUTIVE SUMMARY

The Uinta Basin Air Quality Study (UBAQS) model results indicate that average ambient concentrations of criteria pollutants will remain below the National Ambient Air Quality Standards (NAAQS) within the six-county Uinta Basin area. As the predominant industrial activity in the Uinta Basin, future oil and gas development is estimated by the model to produce emissions that will not exceed the maximum levels of air pollutants that can exist in the outdoor air. Unacceptable effects on human health or the public welfare are not estimated to occur.

Because air quality is a concern of the public, regulatory agencies, and oil and gas operators in the basin, the Independent Petroleum Association of Mountain States (IPAMS), in cooperation with the Bureau of Land Management (BLM) and nine other interested government agencies, contracted a nationally recognized air quality consulting company, ENVIRON International Corporation, to estimate changes to air quality and air quality related values (AQRV) within the Uinta Basin that may result from future industrial activity, including oil and gas development.

The goals and methodologies used to develop the UBAQS were cooperatively agreed upon by the group. The goals include:

- Determining possible air quality trends that may result from current and future oil and gas activity in the Uinta Basin in addition to other industrial emission sources;
- Estimating future changes to air quality in the Uinta Basin as concentrations of criteria pollutants and AQRVs;
- Providing federal land managers and regulatory agencies with a mechanism to estimate the possible air quality effects of a proposed project to facilitate informed planning decisions; and
- Providing a tool that can be updated as operational conditions change and monitoring data are collected.

In a series of meetings held during 2008, the UBAQS modeling protocol was developed to incorporate state-of-the-art scientific methodologies to meet the highest standards of analysis and ensure that the results are unbiased and acceptable to all participating parties and independent reviewers. The protocol utilized the Community Multiscale Air Quality (CMAQ) model to estimate changes to all criteria pollutants. The EPA design value methodology was used to estimate changes to ozone and particulate matter. The protocol included three model scenarios: (1) an evaluation of the model's performance; (2) a baseline of typical conditions; and (3) a reasonable estimate of future conditions. The baseline year was chosen as 2006, and the projected future year was chosen to be 2012

The CMAQ model utilized a 12-kilometer (km) grid to evaluate the Uinta Basin and surrounding areas, including Salt Lake City. A 36-km grid encompassed the remainder of the continental United States. The smaller 12-km grid provided greater resolution of effects in the focus area. The focus area includes the six counties that contain the Uinta Basin, which are Carbon, Duchesne, Emery, Grand, Uintah, and Wasatch counties.

Input data to the model consisted of current emissions data compiled by the Western Regional Air Partnership (WRAP) of the Western Governors Association. Data for oil and gas activity in

southwest Wyoming were also included. Emissions data from outside of the six counties were incorporated into the model because these "outside" sources may also impact the air quality in the basin. The emissions data were then paired with 2005 and 2006 meteorological data during the modeling process. A model performance evaluation was conducted by following procedures detailed in the EPA's modeling guidance and compared against model performance goals developed, in part, by the EPA to ensure that the results remained within accepted modeling standards.

Although the UBAQS model evaluated criteria pollutants, including particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen oxides (NO_x), ozone, sulfur dioxide (SO_2), and carbon monoxide (CO), the focus of the UBAQS was NO_x and volatile organic compounds (VOC), which are the primary emissions from oil and gas development. These emissions directly relate to ozone formation and visibility impairment due to NO_3 and nitrogen deposition. The UBAQS evaluated AQRVs as changes in visibility and acid deposition.

Ozone: The CMAQ model estimated that the Uinta and Piceance Basins would be in attainment of the 8-hour ozone NAAQS for 2012. The EPA design value methodology predicted that air quality monitors that currently show NAAQS ozone violations would continue to do so. These monitors are located in the Salt Lake City area. Year 2012 design values in rural areas would achieve the 8-hour ozone NAAQS except for an area at the border of Duchesne and Summit counties and three grid cells in Emery County.

NOx: The maximum CMAQ-estimated annual NO_2 concentration would represent up to 33% of the allowable NAAQS, or well below the regulatory standard.

PM: The CMAQ model and EPA design value methodology estimated that the annual average $PM_{2.5}$ concentrations would be well below the NAAQS in 2012. The EPA design value results indicated that $PM_{2.5}$ concentrations would decrease at over 80% of the monitored locations, and the annual $PM_{2.5}$ NAAQS would be attained for 2012 throughout the Uinta Basin. CMAQ estimated that the maximum 24-hour $PM_{2.5}$ concentrations would be below the NAAQS in 2012, except for a few scattered grid cells located at the Utah-Colorado border. CMAQ also estimated that the maximum 24-hour PM_{10} concentrations would exceed the NAAQS at the Utah-Colorado border.

SO_2, CO: The maximum 3-hour, 24-hour and annual SO_2, maximum 1-hour and 8-hour CO concentrations would represent up to 33% of the allowable NAAQS, or well below the applicable regulatory standards.

AQRVs: There are no ambient standards for AQRVs. The BLM has used a 1.0 change in deciview threshold for visibility and the United States Forest Service (USFS) uses 5 kilograms per hectare per year (kg/ha/yr) and 3 kg/ha/yr level of concern (LOC) for, respectively, sulfur and nitrogen annual deposition. The CMAQ model predicted that Dinosaur National Monument would be the sensitive Class II area with the highest visibility impacts. A 1.0 deciview change may occur at the monument over a time period ranging from 21 to 54 days per year. The estimated change in total nitrogen deposition at all Class I and sensitive Class II areas are 97% or more below the USFS LOC value. Sulfur deposition was estimated to decrease between 2006 and 2012 at all of the Class I and sensitive Class II areas.

Relative accuracy of an air model depends on how closely the assumptions used in the model replicate what actually occurs. Although useful as a predictive tool, the ability of a model to predict performance is constrained by the kind of software used, quality and amount of input data, key assumptions, and professional qualifications of the modeling team. The air quality modeling assumptions and parameters used in UBAQS are conservative and designed to ensure oil and gas activity and corresponding emissions levels are not understated. Oil and gas activity and associated emissions may be lower than what was predicted by the model. Modeled exceedances for any pollutant may not correlate with actual measured values in 2012 because of the inherent conservative biases built into the modeling that tend to overestimate pollutant concentrations and effects to AQRVs. Compliance with the NAAQS is determined by measured monitor data. Models use a variety of estimation procedures that can be constrained by monitor data where available. If monitor data are incomplete or unavailable, the conclusions drawn from modeled estimates should be considered reasonable approximations, at best. The distinctions between actual monitor data, which represent measured concentrations of air quality, and model estimates should be considered while evaluating the significance of the model results.

The UBAQS results should not be considered actual measurements. In order to develop more accurate future model results, additional air quality monitoring is needed in the Uinta Basin. Two ambient air quality monitors were installed in the Uinta Basin in December 2008 near Red Wash and Ouray. These monitors will be able to provide actual air quality measurements indicative of real conditions for use as input into future UBAQS model runs. The inclusion of this near-field monitoring data will greatly improve the relative accuracy of future Uinta Basin modeling. Updated model results from a continuing UBAQS effort would ensure that air quality within the Uinta Basin is maintained at levels acceptable by regulators and those who live and work in the communities of the Uinta Basin.

Final Report:

Uinta Basin Winter Ozone and Air Quality Study

December 2010 - March 2011

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DOCUMENT NUMBER: EDL/11-039
REVISION: ORIGINAL RELEASE
DATE: JUNE 14, 2011

EXECUTIVE SUMMARY

The Uintah Impact Mitigation Special Service District (UIMSSD) enlisted a team from Utah State University Research Foundation's (USURF) Energy Dynamics Laboratory (EDL) and Utah State University's (USU) Department of Civil and Environmental Engineering to perform an air quality monitoring program to measure baseline ozone concentrations. The program consisted of two integrated elements: (1) a three-month winter ozone monitoring program throughout the Uinta Basin and (2) a more intensive, week-long monitoring program that simultaneously measured ozone, volatile organic compounds (VOCs), nitrogen oxide pollutants (NO_x), fine particulate matter with a diameter less than 2.5 micrometers ($PM_{2.5}$), and vertical profiles of relevant meteorological parameters during a strong winter inversion event at two sites.

Ozone concentrations were measured at 18 locations throughout the Basin during the three-month monitoring program. Eight of the locations had previously established ozone-monitoring stations operated by outside agencies. The other ten locations utilized 2B Technology Model 205 Dual-Beam ozone monitors installed by the EDL-USU team specifically for this study. EDL-USU monitors were strategically located to provide adequate spatial coverage, to account for variations in topography and meteorology, and to avoid results bias due to proximity of potential ozone precursor sources. Every two weeks, the monitors were serviced, data were collected, and recalibrations were performed (if necessary).

The results of the Basin-wide winter ozone study showed elevated wintertime ozone concentrations throughout most of the Uinta Basin during wintertime temperature inversion events. The inversion events had the effect of reducing the vertical movement of the precursors involved in the formation of ozone, resulting in increased ozone formation below the inversion layer. Low surface winds (< 2 m/s) within the inversion layer were also observed throughout the Basin during periods of elevated ozone levels. Low surface winds limited the horizontal movement and dispersion of precursors and pollutants.

Although the data collected for this study cannot be used for regulatory purposes, a high number of 8-hr National Ambient Air Quality Standard (NAAQS) exceedances were observed at multiple locations throughout the Basin, with the fewest exceedances occurring in the higher elevations along the periphery of the study area. The highest ozone values typically were observed in the area centered along the Ouray/Pariette Draw locations and extending north to the Cedarview/Lapoint area, east to the Red Wash area, and west to Duchesne. The highest 1-hr value was observed at Ouray (149 ppb), and Pariette Draw was the site of both the highest observed 8-hr value (134.6 ppb) and the greatest observed fourth-highest (regulatory) ozone value (121.6 ppb). The highest number of 8-hr exceedances (25) was observed at both Ouray and Horse Pool. And while Fruitland and Nine Mile Canyon were the only sites to show no exceedances of the 8-hr standard, the Altamont, Rabbit Mountain, and Rangely, CO, sites (one, three, and three exceedances, respectively) would also be considered attainment areas under the current ozone NAAQS.

These results from the study suggest that the ozone concentrations observed during the wintertime inversion periods are a function of local topography, meteorology, and ozone precursor abundance rather than of any exterior mid- or long-range transport. Results also showed that the lower elevation monitoring locations with the greatest number of nearby wells tended to have the highest ozone concentrations (1-hr and 8-hr averages) and the greatest number of NAAQS exceedances. Locations at higher elevations, approximately 5500-6000 ft above sea

level (asl), had relatively few exceedances despite being near significant numbers of oil and gas wells.

The long-term, Basin-wide ozone measurement was supplemented with a short, high-intensity effort focused on the collection of $PM_{2.5}$, NO_x, and VOCs concentrations during a strong winter inversion event. This intensive monitoring portion of the winter ozone study was conducted from February 21 through February 25, 2011 at the Red Wash and the Vernal/Jensen sites. Ambient samples of NO_x, $PM_{2.5}$, non-methane hydrocarbons (NMHC)/VOCs, and vertical meteorological parameters (temperature, pressure, wind speed, and wind direction) were collected at both sites. Though not part of the proposed study, grab samples for methane analysis (whole air vials) were collected at both sites, and vertical ozone data were taken at Red Wash.

NO_x measured highest at the Vernal location but at levels typical of rural/semi-urban areas. The NO_x measurements also displayed a typical traffic-related diurnal profile. All measured levels of NO_2 were well below the 100 ppb, 1-hr NAAQS. Also, an observed dominance of NO_2 suggests the presence of a readily oxidized air mass, indicating that plenty of ozone was available to convert initially emitted NO to NO_2.

The CH_4 concentrations measured at Vernal were consistent with Northern Hemispheric background levels (1.7-1.8 ppm). The observed CH_4 concentrations at Red Wash (2.7-5.5 ppm) were significantly above the Northern Hemispheric background levels. CH_4 is usually considered non-reactive due to its relatively slow reaction rates, but at such elevated levels, CH_4 could be a significant player in atmospheric photochemistry of ozone formation in the Basin. Measured levels of NMHC at the Red Wash location were more than twice the observed concentrations at the Vernal site. The measured ratio of indicator compounds, benzene-to-toluene, is suggestive of oil and gas exploration and production.

Observed $PM_{2.5}$ concentrations were well below the NAAQS (35 $\mu g/m^3$) at both Vernal and Red Wash, but concentrations at the Vernal location were approximately twice those of the Red Wash location. These results are inconsistent with measurements previously observed by the Utah Division of Air Quality (UDAQ) that showed some exceedances of NAAQS in Vernal in the mid-2000s. The chemical composition of the particulate matter measured at both sites was approximately 80% carbonaceous material, with just under 70% being organic carbon (as opposed to elemental/black carbon). This percentage indicates an abundance of long-chain VOCs characteristic of the oil and gas industry.

Vertical meteorology measurements at the Red Wash site indicate that during an inversion event, the mixing height (surface layer) was on the order of 20-80 m (65-265 ft) above ground level (agl) and was dependent on time of day; vertical ozone data also show similar surface layer depths and patterns. Meteorological data indicate that horizontal winds were light (< 2 m/s) during inversion conditions throughout the Uinta Basin. The higher elevation areas, > 6500 ft above sea level (asl), showed more variable wind directions and higher wind speed during the same period. These higher elevation areas were probably located above the inversion. Limited vertical ozone profiles observed at the Red Wash location showed higher levels of ozone near the ground, an indication that ozone is being formed at ground level rather than from precursors being transported into the Basin.

Meteorological stations at lower elevations (<6500 ft asl) within the Basin indicated that horizontal winds were generally light (< 2 m/s) during inversion conditions. The higher elevation stations (> 6500 ft asl) showed wind data more consistent between sites and at higher

wind speeds than those at lower elevations. This finding suggests that the surface level winds within the lower elevation areas of the Basin, where the temperature inversions and elevated ozone concentrations were measured, were effectively disconnected from the regional air flow.

Modeling of winter ozone was performed as part of this project. The results of these efforts indicated several concerns about the chemical mechanisms used for modeling ozone reactions. For these calculations, a base model was designed to simulate a late-winter day, Feb. 20, 2008 in the Upper Green River Basin (UGRB). Three concerns were identified from these modeling efforts: 1) current mechanisms neglect temperature dependence of all photochemical reactions; 2) many reactions appear with negative activation energies, an indication that their rates may not extrapolate well to lower temperatures; and 3) many non-photochemical reactions also appear without temperature dependence, which probably indicated that they were only measured at a single temperature in the vicinity of 300 K. These concerns may lead to a positive bias in modeled levels of ozone of up to 10 ppb.

follow the well densities even in areas where in the sampler spacing was less than ideal (e.g., the area between Pariette Draw, Nine Mile Canyon, and Duchesne).

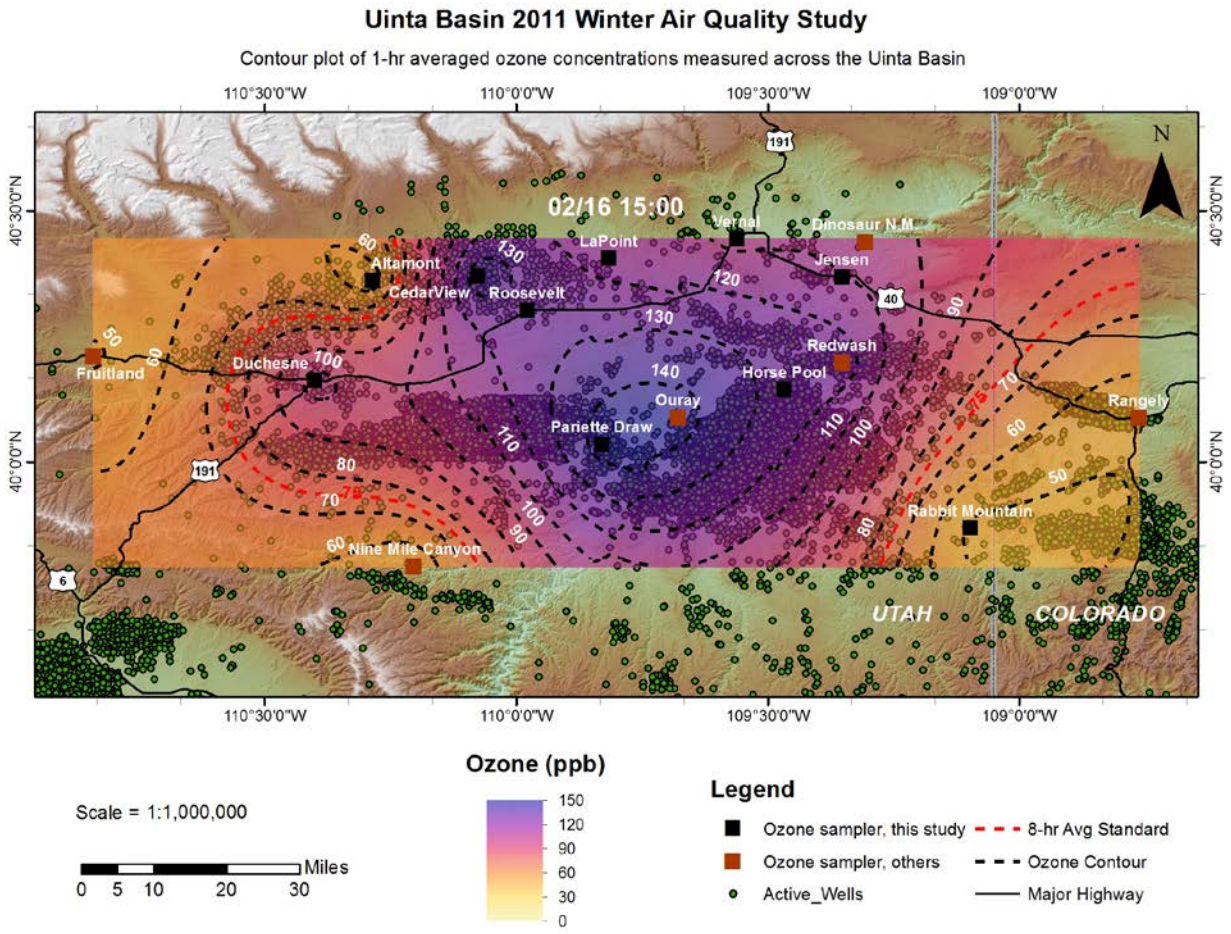

Figure 4-2. Observed 1-hr ozone concentrations within Utah's Uinta Basin (15:00, Feb. 16, 2011) in spatial relation to the region's active oil and gas wells.

Table 4-1 summarizes the available data from the Uinta Basin ozone sampling stations previously discussed. As can be seen, only two sites within the study region, Fruitland and Nine Mile Canyon, showed no exceedances of the 8-hr ozone standard with maximum 8-hr values of 48.6 and 55.6 ppb, respectively. From these data, it can be seen that these locations, at a minimum, represent the outer boundaries of the ozone-impacted areas of the Uinta Basin. Additionally, three other sites, Altamont, Rabbit Mountain, and Rangely (CO), had fewer than four 8-hr exceedances and would not be consider nonattainment with fourth highest 8-hr concentrations of 68.5, 73.4 and 73.4 ppb, respectively, for this winter measurement period. The data from these "fringe" sites suggest that the ozone concentrations observed during the wintertime inversion periods are a function of local topography, meteorology, and ozone precursor abundance rather than any exterior mid- or long-range transport.

Utah's Environment: 2011: Cleaner Air: Uintah Basin

- Pollutants
- Uintah Basin
- Utah Clean Diesel Program

Three-State Pilot Project

The EPA, under the National Environmental Policy Act, is mandated to document current air pollution levels and lessen current and projected adverse impacts through mitigation strategies. Localized monitoring in the three-state area (western Colorado, eastern Utah, and southwestern Wyoming) has revealed degraded air quality in regard to ozone and Nitrogen oxide (NOx), leading federal and state agencies to realize more information is needed as energy development in the region is considered. Because of a common need for a comprehensive set of air quality assessment tools, the stakeholders—EPA Region 8, the Bureau of Land Management, the USDA Forest Service, the National Park Service, and the states of Utah, Colorado, and Wyoming—are Â cooperating on measures to improve air quality.

The Utah component of the first phase of this project included the deployment of two air monitoring stations, one at Price and the other at Fruitland. The data from these two sites will be entered in a data warehouse being developed under the second phase of the project. Work conducted under the Three-State Pilot Project will be directly applicable to the ozone studies currently underway in the Uintah Basin.

Uintah Basin Ozone

The National Park Service has been measuring summertime ozone since 2005 in Dinosaur National Monument, located near Vernal, Utah, and since 2006 in Colorado National Monument, located near Grand Junction, Colorado. The EPA began measuring year-round ozone at two sites on the Ute Indian Reservation, located near Redwash and Ouray, in 2009. The official air quality levels for the Uintah Basin are currently in compliance with the ozone National Ambient Air Quality Standards (NAAQS). However, data collected from the two tribal sites during the winter of 2010 indicated that high ozone levels are occurring in the Basin during the middle of winter. This finding was unexpected, since ozone is normally an air pollutant that is formed during the summertime when high temperatures and bright sunshine occur.

A wintertime specific ozone study funded by the by the Uintah Basin Impact Mitigation Special Service District was conducted by the Energy Dynamics Lab and Utah State University in the winter of 2010/11. Using data collected from 18 temporary and permanent air monitoring stations placed throughout the Basin, they found elevated wintertime ozone concentrations throughout the Basin during temperature inversion events when snow covered the ground. The highest values were found in the central basin area with many exceeding the ozone NAAQS.

During the winter of 2011/12, an expansive, cooperative study lead by DEQ commenced to help understand how ozone is formed within the Basin during wintertime inversion conditions. The answer to this question is crucial to implementing appropriate and effective strategies for mitigating high ozone levels. Researchers from the National Oceanic and Atmospheric Administration, several University research groups, the EPA, and DEQ, are working together on this unprecedented air quality study.

Uintah Basin 2012 Winter Ozone Study

- **What**: The Utah Division of Air Quality is coordinating the Uintah Basin 2012 Winter Ozone Study this winter starting in January and running through March with an intensive research period focused on the month of February when the highest likelihood of temperature inversions, snow cover, and elevated ozone levels are expected. Preliminary results and conclusions from the study are scheduled for the following July.
- **Why**: The Study is needed to understand how ozone is formed in the Basin during wintertime inversion

conditions. Understanding the chemical pathways that are unique to the Basin's wintertime situation is crucial to implementing appropriate and effective strategies for mitigating high ozone levels.

- **Who**: The Study is a joint effort of world-class atmospheric researchers from the USU/Energy Dynamics Lab, National Oceanic and Atmospheric Administration's (NOAA) Chemical Sciences and Global Monitoring Divisions, University of Colorado's Institute of Arctic and Alpine Research, and Utah Division of Air Quality. This is by far the largest and most complex air quality study ever conducted in the State of Utah.

- **Cost**: The Study is broadly supported financially by numerous agencies, including the Uintah Basin Impact Mitigation Special Service District, Western Energy Alliance, Bureau of Land Management—Utah Office, and the Environmental Protection Agency-Region 8. The contribution total is nearly $3 million. The State of Utah, NOAA, and the University of Colorado-Boulder also made significant in-kind equipment contributions to this study.

- **Research**:

    1. Distributed Basin-wide ozone and precursor measurements to determine the spatial extent.
    2. Long-term monitoring of ozone and key precursors at two "super sites," Roosevelt and Horse Pool, to provide trends against which energy production increases and mitigation work can be evaluated.
    3. Intensive atmospheric chemistry studies to understand the chemical pathways and what the limiting formation precursors are.
    4. Development of a detailed, complete inventory of emissions sources in the Basin, including information on location, operation, and pollutants emitted.

- **Goal**: Identify effective, appropriate mitigation strategies that can be implemented to reduce the chemical precursors to wintertime ozone formation in the Basin. Protect the health and economic base of local citizens.

Contact Donna Spangler for further information on the content of this page.